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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/619,535
Filing Date: July 19, 2000
Appellant(s): GROH ET AL.

George F Lesmes
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 06/02/05

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Please note that a non-related, but similar case (09/619531) is also pending at the Board of Appeals.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct with one minor error. Claims 40-42 have been allowed. There is no claim 43.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(7) Prior Art of Record

RE 33,023	***Hiers***	***08-1989***
5,171,629	***Heidel et al***	***12-1992***
5,616,395	***Baravian et al***	***04-1997***

(8) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

(i) Claims 1, 3-10, 14,15,17 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Hiers, RE 33,023. This rejection is set forth prior Office Actions, mailed on 03/01/2004 and 10/06/04.

The patent issued to Baravian et al., teach a two-layer textile reinforcement comprising a thermostabilized consolidated non-woven first base layer needled to a second mineral fiber layer, which may in the form of a grid, scrim or cloth of continuous or discontinuous mineral filaments (Abstract). Baravian et al., teach the application of heat to consolidate the non-woven and preferably comprises a sheet of continuous filaments of a thermoplastic synthetic polymer, having no binder fibers, such as a polyester, co-polyester, or polyamide (Column 2, 63-65 and Column 3, 45-55). Baravian et al., clearly teach that the second mineral layer preferably takes the form of a scrim of mineral fibers formed by wet or dry non-woven processes, more particularly discontinuous glass fibers with chemical or thermal bonding (Column 3, line 65-Column 3, line 5). In this case, chemical bonding is interpreted by the Examiner as any type of resinous based binder. The Examiner acknowledges that Baravian et al., does not explicitly teach the orientation of the layers (i.e., glass layer positioned below the synthetic layer), however, it well known in the art that glass fibers are not needled due to the fact that they are too fragile and would break. In further support of this assertion, Hiers also teaches disposing the glass layer between two synthetic non-woven layers (Figures 1 and 2, Column 3, 55-68 and Column 6, 7-69). Thus, it is obvious that the synthetic layer is the upper layer during needling. With regard to the heat-shrunken limitation, Baravian et al., teach a non-woven sheet of polyolefin filaments, which is

calendared under heat and pressure to achieve the desired shrinkage and density (Column 4, 45-57). Presently claim 1 does limit when the heat shrinking occurs, but only that it takes place. Without such limitations, it is the position of the Examiner that calendaring a synthetic non-woven sheet under heat and pressure would effectively heat shrink the fibers comprising the non-woven layer.

Though, Baravian et al., does not explicitly teach specific needling embodiments or the degree of needling, it would be improper to ignore the disclosure directed to needle bonding regardless if the method it is not exemplified. The fact remains that Baravian et al., teach needle bonding as a means to join the two layers together. With regard to limitation of "needling such that a portion of the fibers of the synthetic non-woven layer passes through the non-woven layer containing the glass fibers and penetrates a side of the layer of glass fibers facing away from the layer of synthetic fibers", it is the position of the Examiner that it is widely known in the art to vary the depth of penetration as function of mechanical strength and composite integrity. For Example, the patent issued to Hiers teaches needling a glass fiber batt and an organic fiber batt together to form a composite such that resulting layers are substantially non-detachable from each other and from an integral composite fabric (Column 4, 39-45). The Examiner would also like to call attention to figure 2 of the Hiers patent, which clearly illustrates needle penetration through all of the layers such that the layers are bound together at the respective inner surfaces (Figure 2, Column 5, 20-35).

Therefore, motivated by the desire to from a composite having sufficient mechanical strength and integrity, it would have been obvious to one having ordinary skill in the art at the time the invention was made to needle the layers in the invention of Baravian et al., such that that

resulting layers are substantially non-detachable from each other and form an integral composite fabric as taught by Hiers.

With regard to claims 3,7, and 8, Hiers teaches a three layer structure comprising a glass batt disposed between two synthetic organic textile layers (Figure 2, Column 6, 5-17 and 60-69). Heirs specifically teach that this three-layer arrangement to avoid the health risks associated with glass fiber breakage during the needling process (Column 3, 32-36, 55-58, and Column 45-28).

Therefore, motivated by the desire to prevent glass fiber breakage during needling it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an additional synthetic non-woven layer to the composite of Baravian et al., to form a three-layer structure as taught by Hiers.

With regard to claims 7 and 8, Hiers teaches that the weight ratios of organic fibers to glass fibers may vary from 1:10 to 10:1, but fails to explicitly teach the weight ratios of each synthetic organic textile layer relative to each other, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the relative ratios of the two synthetic organic textile layers as a function of desired end use, strength, durability, composite integrity and balance of properties. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233

With regard to claims 14 and 15 it is the position of the Examiner that the needling machine and needle draft constitute method limitations not shown to materially effect the final product structure. However, Hiers does teach aggressive and less aggressive needling as a function of the number of needles per square inch per stroke and/or barb configuration. For

Example, the greater number of needles per inch per stroke or the, less fiber mobility and, hence is more aggressive. Conversely, the fewer number of needles per inch per stroke results in greater fiber mobility, and is thus considered less aggressive. Hiers teaches adjusting the number of needles per inch per stroke as a function of desired end use. Therefore, regardless of the preferred number of needles stroke per inch per stroke, Hiers evidences that varying the number of needles per inch per stroke is known in the art (Column 5-47). To that end, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the number of needles per inch per stroke as function of desired end use. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233

With regard to claim 17, Hiers teaches using E-glass fibers (Column 7, 5-10). It is commonly known in the art that E-glass provides good tensile, compressive strength, stiffness, and electrical properties.

Therefore, motivated by above aforementioned properties it would have been obvious to one having ordinary skill in the art to form the glass layer of Baravian et al., using the E-glass fibers taught by Hiers.

Therefore, motivated to provide a synthetic non-woven having good heat shrinking properties, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the non-woven layer of Baravian et al., using the polyester fibers taught by Hiers.

(ii) Claims 2,12 and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over over Baravian et al., US 5,616,395 in view of Hiers, RE 33,023 applied to claim 1 above, and

further in view of Heidel et al., US 5,171,629. This rejection is set forth prior Office Actions, mailed on 03/01/2004 and 10/06/04.

The combination of Baravian et al., and Hiers fails to teach what binders are suitable for chemically binding the glass non-woven, however, the patent issued to Heidel et al. discloses a glass fiber mat and synthetic fiber mat that are needled together. Heidel et al. teach pre-consolidating the glass fiber mat with polymer binders or melamine resins (Column 2, lines 14-17).

Therefore, motivated to provide a stabilized mineral fiber non-woven layer, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polymer binders or melamine resins taught by Heidel et al., to consolidate the glass fiber layer of Baravian et al.

With respect to claims 12 and 13, Heidel et al., lacks an explicit teaching as to the amount of binder, but does state that low amounts are suitable due to the bonding strength melamine resins. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the amount of resin used to pre-consolidate the glass fiber mat. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum value of a results effective variable involves only routine skill in the art. *In re Boesch 272, 205 USPQ 215 (CCPA 1980)*

(iii) With regard to claims 40-42, the prior art of record fails to teach the addition of reinforcement materials. An updated art search did not produce any new substantial art for which to base a rejection and presently there is no motivation to combine references to form an obvious type rejection.

(9) Response to Argument

(i) Claims 1, 3-10, 14,15,17 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Hiers, RE 33,023.

Applicant argues a lack of motivation to combine the references of Baravian et al., and Hiers. Specifically, Applicant contends that the laminates taught by the references disclose only two layer laminates rather than the laminates set forth in instant claims 3,7, and 8. Applicant further contends that the glass fiber layer is not consolidated and the needling taught by the combination of Baravian et al., in view of Hiers does not meet the limitation of joining the instantly claimed glass non-woven and synthetic non-woven by needling such that a portion of the fibers of the synthetic non-woven layer passes through glass non-woven layer. These arguments are not found persuasive.

With respect to the Applicant's argument that the references teach only two layer laminates, and no motivation exists to combine the above aforementioned references to form the three layer structures set forth in claims 3,7, and 8, the Examiner respectfully points out that Baravian et al., alternatively teaches a three layer reinforcement structure though it may not be exemplified or preferred (Column 2, 7). The Examiner maintains that in light of such a teaching, motivation to modify the two layer laminate structure of Baravian et al., with the teachings of Heirs exists.

Recall, Hiers teaches a three layer structure comprising a glass batt disposed between two synthetic organic textile layers (Figure 2, Column 6, 5-17 and 60-69). Heirs specifically teaches this three layer arrangement to avoid the health risks associated with glass fiber breakage during the needling process (Column 3, 32-36, 55-58, and Column 45-28).

With regard to Applicant's argument that the glass fiber layer taught in Baravian et al., is not consolidated, the Examiner respectfully points out that claim 1 presently recites the limitation of a non-woven mat containing glass staple fiber pre-consolidated with a chemical binder. To that end, the Examiner is of the position that Baravian et al., meets said limitation with the disclosure of providing a second mineral layer in the form of a scrim of mineral fibers formed by wet or dry non-woven processes, more particularly discontinuous glass fibers with chemical or thermal bonding (Column 3, line 65-Column 3, line 5). To reiterate, it is the position of the Examiner that chemical bonding is interpreted as any type of resinous based binder.

With regard to Applicant's argument that the combination of references fails to teach needling such that a portion of the synthetic fibers passes through the glass non-woven such that protruding fibers serve to "inter-lock" the layers together, the Examiner respectfully points out that Applicant has not limited the degree of needling to "inter-lock". The Examiner submits that Baravian et al., clearly teach needling the non-woven base layer with the second mineral layer and that adhesively bonding in addition to any needling operation is not precluded from Applicant's instant claim 1. In other words, though Baravian et al., may not exemplify needling as a technique for joining the two layers together, to ignore the disclosure directed to needling either solely or addition to adhesive bonding would be improper. Thus, the Examiner maintains that needling inherently passes fibers through the layers.

To substantiate the Examiners supposition, the reference of Heirs was provided as evidence. Recall, the patent issued to Hiers teaches needling a glass fiber batt and an organic fiber batt together to form a composite such that resulting layers are substantially non-detachable from each other and from an integral composite fabric (Column 4, 39-45). The Examiner would

also like to call attention to figure 2 of the Hiers patent, which clearly illustrates needle penetration through all of the layers such that the layers are bound together at the respective inner surfaces (Figure 2, Column 5, 20-35).

With specific regard to claim 10, the patent issued to Baravian et al., teaches a two-layer textile reinforcement comprising a thermostabilized consolidated non-woven first base layer needled to a second mineral fiber layer, which may in the form of a grid, scrim or cloth of continuous or discontinuous mineral filaments (Abstract). Baravian et al., teaches the application of heat to consolidate the non-woven and preferably comprises a sheet of continuous filaments of a thermoplastic synthetic polymer, having no binder fibers, such as a polyester, co-polyester, or polyamide (Column 2, 63-65 and Column 3, 45-55). Thus it is the position of the Examiner that calendaring a synthetic non-woven sheet under heat and pressure would effectively heat shrink or "thermally pre-consolidate" the fibers comprising the non-woven layer (Column 3, 1-5).

(ii) Claims 2,12 and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over over Baravian et al., US 5,616,395 in view of Hiers, RE 33,023 applied to claim 1 above, and further in view of Heidel et al., US 5,171,629.

Applicant argues a lack of motivation to combine references on the grounds that there is no explicit disclosure provided by Baravian et al., to pre-consolidate with melamine resins or polymeric binders. Applicant asserts that the cited art provides no motivation to use the resins disclosed by Heidel et al. This argument is not found persuasive.

The patent issued to Baravian et al., teach consolidating the glass mat with chemical bonding, but fails to a specific chemical resin or polymer. As such, it is the position of the Examiner that it is proper to look to the prior art to identify suitable chemicals for the intended

purpose of consolidating glass fibrous non-woven fabrics. Accordingly, Heidel et al., was provided to evidence that polymeric binders and melamine resins are suitable for consolidating glass non-woven fabrics.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

ls
August 17, 2005

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